Advanced Structural Design Training Course

Professional Development Training Course Outline

Category	Construction Institute	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Advanced Structural Design Training Course is designed to equip professionals with advanced knowledge and practical skills in modern structural engineering. As the construction industry rapidly adopts Building Information Modeling (BIM), Performance-Based Design (PBD), seismic engineering, finite element analysis (FEA), sustainable construction, digital structural modeling, AI-driven engineering solutions, and international design standards, professionals must continuously upgrade their expertise to remain globally competitive. This intensive training combines theoretical principles with practical applications using real-world engineering projects and internationally recognized design codes, enabling participants to confidently design safe, resilient, economical, and sustainable structures.

The course emphasizes the latest trends in advanced structural analysis, reinforced concrete design, steel structure design, earthquake-resistant design, structural optimization, digital engineering, infrastructure resilience, risk assessment, smart construction technologies, and computational structural engineering. Participants will gain hands-on experience through software-based design exercises, case studies, design workshops, and industry best practices that improve technical competency and decision-making capabilities. By the end of the program, participants will possess the advanced analytical, design, and project management skills required to deliver innovative structural solutions that comply with international engineering standards while addressing modern construction challenges.

Programme Curriculum

Advanced Structural Design Training Course

Introduction

Advanced Structural Design Training Course is designed to equip professionals with advanced knowledge and practical skills in modern structural engineering. As the construction industry rapidly adopts Building Information Modeling (BIM), Performance-Based Design (PBD), seismic engineering, finite element analysis (FEA),

sustainable construction, digital structural modeling, AI-driven engineering solutions, and international design standards, professionals must continuously upgrade their expertise to remain globally competitive. This intensive training combines theoretical principles with practical applications using real-world engineering projects and internationally recognized design codes, enabling participants to confidently design safe, resilient, economical, and sustainable structures.

The course emphasizes the latest trends in advanced structural analysis, reinforced concrete design, steel structure design, earthquake-resistant design, structural optimization, digital engineering, infrastructure resilience, risk assessment, smart construction technologies, and computational structural engineering. Participants will gain hands-on experience through software-based design exercises, case studies, design workshops, and industry best practices that improve technical competency and decision-making capabilities. By the end of the program, participants will possess the advanced analytical, design, and project management skills required to deliver innovative structural solutions that comply with international engineering standards while addressing modern construction challenges.

Course Duration

5 days

Course Objectives

Upon completion of this training, participants will be able to:

1. Master advanced structural analysis techniques for complex engineering structures.
2. Design high-rise buildings using international structural design standards.
3. Apply Performance-Based Structural Design (PBSD) principles for resilient infrastructure.
4. Perform Finite Element Analysis (FEA) for structural modeling and optimization.
5. Design earthquake-resistant structures using seismic engineering principles.
6. Develop advanced reinforced concrete and prestressed concrete structural systems.
7. Design steel structures for industrial, commercial, and infrastructure projects.
8. Integrate Building Information Modeling (BIM) into structural engineering workflows.
9. Apply structural optimization and value engineering techniques to reduce construction costs.
10. Evaluate structural health monitoring (SHM) systems for infrastructure maintenance.
11. Implement AI-assisted structural design and digital engineering technologies.
12. Perform risk assessment and structural safety evaluation for critical infrastructure.
13. Develop sustainable and green structural engineering solutions aligned with global ESG standards.

Target Audience

1. Structural Engineers
2. Civil Engineers
3. Consulting Engineers
4. Construction Project Managers
5. Architects
6. Infrastructure Engineers
7. BIM Engineers and Design Coordinators
8. Government Engineers, Researchers, and Engineering Consultants

Course Modules

Module 1: Advanced Structural Engineering Principles

- Fundamentals of advanced structural behavior
- Load paths and structural stability
- Advanced load combinations
- International structural design codes
- Structural reliability and safety
- **Case Study:** Structural design evaluation of a 40-story commercial building.

Module 2: Advanced Structural Analysis

- Linear and nonlinear structural analysis
- Dynamic structural analysis
- Finite Element Analysis (FEA)
- Structural modeling techniques
- Structural optimization methods
- **Case Study:** Finite Element Analysis of a long-span bridge.

Module 3: Advanced Reinforced Concrete Design

- High-strength concrete design
- Prestressed concrete systems
- Shear wall design
- Deep beam analysis
- Foundation design optimization
- **Case Study:** Design of a high-rise reinforced concrete residential tower.

Module 4: Advanced Steel Structure Design

- Steel member design
- Composite structures
- Industrial steel buildings
- Connection design
- Structural fabrication considerations
- **Case Study:** Structural design of a large industrial warehouse.

Module 5: Earthquake & Wind Resistant Structural Design

- Seismic hazard assessment
- Performance-Based Seismic Design
- Wind load analysis
- Base isolation systems
- Structural retrofitting
- **Case Study:** Seismic retrofit of an existing hospital building.

Module 6: BIM and Digital Structural Engineering

- Building Information Modeling (BIM)
- Structural coordination using BIM
- Digital twins in construction
- AI applications in structural engineering
- Cloud-based structural collaboration
- **Case Study:** BIM implementation for a mixed-use development project.

Module 7: Structural Safety, Risk & Sustainability

- Structural risk assessment
- Structural health monitoring
- Green building structural solutions
- Life-cycle structural performance
- Infrastructure resilience
- **Case Study:** Sustainability assessment of a public infrastructure project.

Module 8: Structural Design Project Workshop

- Integrated structural design project
- Software-based structural modeling
- Design verification
- Technical documentation
- Presentation of engineering solutions
- **Case Study:** Complete structural design of a multi-storey commercial complex from concept to final design.

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
28 Sep 2026	02 Oct 2026	Online	$1,000
28 Sep 2026	02 Oct 2026	Physical	$1,500
28 Sep 2026	02 Oct 2026	Physical	$0
28 Sep 2026	02 Oct 2026	Physical	$0
28 Sep 2026	02 Oct 2026	Physical	$0
28 Sep 2026	02 Oct 2026	Physical	$0
28 Sep 2026	02 Oct 2026	Physical	$0
28 Sep 2026	02 Oct 2026	Physical	$0

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com